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BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 1

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LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 1

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CLONING CHLOROPLAST DNA IN E. COLI UDC 575.11:576.851.48

Moscow GENETIKA in Russian Vol 15 No 11 Nov 79 pp 1918-1924 manuscript received 3 Jan 79

ANDRIANOV, V. M., AMERKHANOV, M. B. and VINETSKIY, Yu. P.: (CLONING CHLOROPLAST DNA in ESCHERICHIA COLI. COMMUNICATION 2. SOME PROPERTIES OF RECOMBINANT PLASMIDS WHICH CARRY EcoRI-FRAGMENTS OF PISUM SAVTIVUM CHLOROPLAST DNA AND THE CLONING OF DNA SEQUENCES WITH rRNA GENES) Institute of General Genetics, USSR Academy of Sciences, Moscow

[Abstract] Andrianov, et al., have already (1976, 1977, 1978) described a method of selection of colicine-defective recombinant plasmids, using mitomycin C. With this method, clones of bacteria had been obtained with plasmids of chloroplasts of Pisum sativum into which various EcoRI-fragments of the chloroplast DNA were included. In the present article, the properties of these fragments, after "amplification" in bacterial cells, are described. The cloroplast DNA EcoRI fragments cloned in E. coli have a variable nucleotide content with substantially-enriched AT-pairs in some of the nucleotides; fragments with a predominant content of GC pairs were not cloned; the nucleotide makeup of the chloroplast DNA was seen, by ultracentrifugation analysis, to be heterogeneous with respect to length. The recombinant plasmid DNAs were alkali stable, indicating absence of ribonucleotides. Figures 4; references 14: 4 Russian, 10 Western (one of which is by Andrianov, et al.).
[107-8586]

USSR UDC 547.963.32

SYNTHESIS OF THE LEUCINE-ENCEPHALIN GENE AND ITS CLONING AND EXPRESSION IN ESCHERICHIA COLI

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 248 No 6, 1979 pp 1486-1491

OVCHINNIKOV, YU.A., academician, DOLGANOV, G. M., YEFIMOV, V.A., MONASTYRSKAYA, G.S., SVERDLOV, YE.D., KHODKOVA, YE.M., CHAKHMAKHCHEVA, O.G., CHESTUKHIN, A.V., and SHEMYAKIN, M.F., Institute of Bioorganic Chemistry imeni M.M. Shemyakin, USSR Academy of Sciences, Moscow

[Abstract] Standard techniques of molecular biology and genetic engineering were employed for the synthesis of a polydeoxyribonucleotide sequence corresponding to the leucine-encephalin gene, and its subsequent incubation with vector plasmid pBR 322 DNA (following hydrolysis with Eco RI and Bam HI endonucleases) and phage Cha 4A DNA (treated with Eco RI) in the presence

of T4 DNA ligase. The resultant DNA product was then employed in the transformation of E. coli HB 101, with the transformed cells being tested for leucine-encephalic production by radioimmunoassay. The results showed that each bacteria containing the reconstructed plasmid produced ca. 5 x 10^4 molecules of encephalin. Figures 2; references 15: 2 Russian, 13 Western.
[71-12172]

USSR UDC 575.114.3

ALTERATIONS IN RECOMBINANT PLASMIDS WHICH AFFECT THEIR EXPRESSION IN ESCHERICHIA COLI K-12

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 248 No 5, 1979 pp 1245-1248 manuscript received 14 Apr 79

VEL'KOV, V.V., FODOR, I.I. and BAYEV, A.A., academician, Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow Oblast

[Abstract] Studies were conducted on the complementation of thr^- point mutation in E. coli by means of recombinant plasmids, using phenotypic characteristics of E. coli to follow changes in the plasmid. A mixture of DNA molecules from strain Streptomyces streptomycini 232 and vector plasmid pCV20 (both DNA preparations pretreated with restrictase Bam HI) were ligated with T4 DNA ligase and the resultant DNA was used for the transformation of E. coli JC 7623 recBC sbc B $arg^-his^-thr^-pro^-leu^-$. Subsequently, a plasmid designated as pSt thr1 was isolated from an E. coli clone with the phenotype $thr^+arg^-his^-pro^-leu^-Ap^rTc^s$ (Ap^r = ampicillin resistant, Tc^s = tetracycline susceptible); its DNA was not restricted by endonucleases Bam HI, Hind III, or Sal I, but only by Eco RI and Sma I, while each of these enzymes restricted pCV20 DNA. pSt thr 1 DNA was used for the transformation of the E. coli JC 7623 strain and E. coli AB 2463; five transformed bacterial clones were isolated with yielded five distinct plasmids which differed from pCV20 in terms of the molecular weight of their DNA molecules and susceptibilities to restrictive endonucleases. These findings were interpreted to support the contention that the initial structure of the recombinant plasmid underwent significant alterations in both JC 7623 and AB 2463 cells. Figures 2; references 12: 3 Russian, 9 Western.
[79-12172]

USSR UDC: 577.156

IMMOBILIZED PROTEINASES USED TO PURIFY SHEEP POX VIRUS

Moscow BIOKHIMIYA in Russian Vol 44 No 10, 1979 pp 1776-1778 manuscript received 29 Jan 79

SHEDRIN, Ye. L.; PROSTYAKOV, A. P.; TSYGANKOVA, S. I., SKALINSKIY, Ye. I., ZINKEVICH, O.D., TITOVA, Ye. G., and BORISOVICH, Yu. F., All-Union State Scientific Control Institute of Veterinary Products, USSR Ministry of Agriculture, Moscow, and Kazan' State Medical Institute

[Abstract] Papain (Merck Co, FRG) and trypsin (Spofa Firm, Czechoslovakia) were immobilized on biogel P-100 at room temperature by the Western technique (1971). These immobilized enzymes were used to treat sheep pox virus of the Poxviridae family, genus Carpipoxvirus. This procedure purified the viral suspension as a result of hydrolysis of inactive proteins, and can apparently be used to purify other virions and proteins by means of proteolysis of low molecular protein admixtures. Figure 1; references 7: 2 Russian, 5 Western. [76-10,657]

USSR UDC 577.154

PROPERTIES OF IMMOBILIZED SUBUNITS OF TRANSKETOLASE

Moscow BIOKHIMIYA in Russian Vol 44 No 12 Dec 79 pp 2115-2120 manuscript received 8 Feb 79

SOLOV'YEVA, O. N. and KOCHETOV, G. A., Laboratory of Molecular Biology and Bioorganic Chemistry imeni A. N. Belozerskiy, Moscow State University, Moscow

[Abstract] Attempts at separate study of the subunits of enzymes, whose function requires an oligomeric structure, are made difficult because the subunits naturally tend to associate. The molecule of transketolase of baker's yeast consists of two subunits identical with respect to molecular weight. In an earlier report (by the authors, 1978 in which the technique was described) the enzyme had been immobilized by covalent bonding with sepharose per subunit. The attendant loss of activity was restored by addition--at appropriate pH--of free subunits of transketolase. The immobilized subunits were found to be catalytically active, and, in this article their properties are studied. The properties studied included i) optimum pH for catalytic activity in the presence of magnesium or calcium ions, ii) relative affinity for the substrates--a substrate-donor and substrate-acceptor of transketolase--and iii) value of the dissociation constant for thiamine

pyrophosphate (TPP). These values did not differ substantially for the immobilized subunits, the immobilized dimer form of the enzyme or the soluble transketolase. In the presence of calcium ions, the immobilized subunits and, also, the soluble transketolase had two types of binding sites for TPP with clearly different affinities for the coenzyme. Thus, the active centers in the dimer molecule appear to be independent. In the immobilization process, a part of the enzyme molecule is completely inactivated and another part fully retains its activity. Catalytic activity of the free and immobilized transketolase was assayed spectrophotometrically according to rate of reduction of oxidized NAD, using glyceraldehydephosphate dehydrogenase as the auxiliary enzyme. Figures 3; references 24: 3 Russian, 20 Western (3 of which were authored by Kochetov, et al.).
[139-8586]

USSR UDC: 577.158.34

HYBRIDIZATION OF IMMOBILIZED D-GLYCERALDEHYDE-3-PHOSPHATE DEHYDROGENASE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 248, No 1 1979 pp 238-241
manuscript received 7 Jun 79

NAGRADOVA, N. K., MURONETS, V. I., ASRIYANTS, R. A. and CHEREDNIKOVA, T. V., Moscow State University imeni M. V. Lomonosov, submitted by Academician S. Ye. Severin on 30 May 79

[Abstract] Recovery of immobilized hybrids of D-glyceraldehyde-3-phosphate dehydrogenase is described, and use thereof for the study of intersubunit interactions in the enzyme molecule is discussed. The material consisted of immobilized apoenzyme dimers from yeast or rat skeletal muscle. The techniques used permit analysis of kinetics of hybridization conditions (immobilized dimers of D-glyceraldehyde-3-phosphate dehydrogenase with soluble dimers) and determination of conditions under which the formed oligomer could undergo dissociation. Figures 2; references 14: 2 Russian, 12 Western.
[73-10,657]

USSR UDC 577.15.024.035.156

FIXATION OF A LIGHT SIGNAL BY A DYE SUBSTANCE IN MICROCAPSULES CONTAINING cis-CINNAMOYLCHYMOTRYPSIN

Moscow BIOKHIMIYA in Russian Vol 44 No 12 Dec 79 pp 2227-2233 manuscript received 3 May 79

AYSINA, P. B., ANDRIANOVA, I. P., KAZANSKAYA, N. F. and LUKASHEVA, YE. V., Chemical Faculty of Moscow State University imeni M. V. Lomonosov

[Abstract] The author's laboratory has been developing highly-sensitive enzyme systems which can be used as photographic materials; catalytically inactive derivatives of proteolytic enzymes are activated with exposure to light. The photographic material is said to be qualitatively more sensitive than that described in several US patents (1970,1972) which involve photoinactivation of proteolytic enzymes under direct action of light. The present article reports efforts to control washing out--from a gelatine backing--of the produced image because of diffusion of the enzyme during wet development. Cis-cinnamoyl chymotrypsin, the stable, light-sensitive derivative of alpha-chymotrypsin was immobilized by micro encapsulation into semi-permeable nylon membranes which were then attached onto the surface of the gelatin backing. The high concentrations of the enzyme, forming under the action of light, are limited by the volume of the capsules and can bring about catalytic conversion of a low-molecular substrate diffusing inside the capsule from the surrounding solution. The low MW substrates used, which penetrate into the capsules, were indoxyl esters of acetic or butyric acid or N-acetyl-L-leucine; there are hydrolyzed to indoxyl, in turn oxidized by oxygen to form indigo which stains the capsules. Diffusion into the photosensitive layer is thus prevented. Figures 2; references 14: 8 Russian, 6 Western (two by Soviet authors).
[139-8586]

USSR UDC 57:536.48.047

PROBLEMS CONNECTED WITH THE THAWING OF BIOLOGICAL MATERIALS

Kiev VISNYK AKADEMIYI NAUK UKRAYINS'KOYI RSR in Ukrainian No 7, Jul 79 pp 76-83

[PUSHKAR, M.S., corresponding member, UkrSSR, LOBINTSEVA, G.S. and POLYAKOVA, A.I., candidates of biological sciences and TIMOSHENKO, YU.P.

[Abstract] This is a review of the literature on cryopreservation of biological materials and their recovery from the anabiotic state. The review covered three sub-topics: cryodestruction of biological systems, occuring

during the thawing process; current methods of thawing; and theoretical considerations of these relationships. The authors concentrated on a range of temperatures in relationship to freezing rates, because they believed that damage to the cells could be avoided by proper selection of optimal freezing-thawing rates. Thawing rates, to be least destructive, should correspond to the freezing rates. The heating process of any substance depends on physical properties of the heated object, its geometrical form, dimensions and its relationship to the surroundings. The real problem faced in this process is the constantly changing temperature gradient between the heat source and the object, which alters the heating rate of the latter during the warm-up process. This can be corrected to some extent by the use of super high frequency current. References 49: 17 Russian, 32 Western. [82-7813]

USSR

STUDY OF MOLECULAR STRUCTURE AND MECHANISMS OF FUNCTION OF CHOLINORECEPTORS OF LYMNAEA STAGNALIS NEURONS BY IN VIVO CHEMICAL MODIFICATION

Moscow BIOFIZIKA in Russian Vol 24 No 5 Sep/Oct 79 pp 854-859 manuscript received 28 Jan 77 and (after modification) 17 Jul 78

BREZHESTOVSKIY, P. D., VUL'FIUS, YE. A., IL'YIN, V. I. and YURCHENKO, O. P., Institute of Bilogical Physics, USSR Academy of Sciences, Pushchino (Moscow Oblast)

[Abstract] Group-specific reagents were used to modify the structure of neurons of the large and small parietal ganglia of Lymnaea stagnalis L. to study function of their cholinoreceptors. The method involved chemically treating the protein fractions or the tissue whose reactive protein sites formed a covalent bond with the reagents (Baker, 1967; Singer, 1967; Vul'fius, et al., 1975). Reagents used included dithiotreitol--specifically reducing S-S bonds,--and a number of alkylating agents--reacting with SH-groups. When the S-S bond is reduced by the dithiotreitol, the cholinoreceptors are inactivated. The S-S groups can be protected from this inactivation by using cholinoreceptor excitants,--cholinomimetics, e.g., tetramethyl-ammonium, and decamethonium--a procedure which appears to alter the conformation of the active center and its surroundings. The capacity of substances to protect the cholinoreceptors correlated with their capacity to increase the conductivity of the membrane. Figures 5; references 13: 5 Russian, 8 Western (one by Soviet authors).
[60-8586]

USSR

UDC 576.8.097.29:582.288

EFFECTS OF MYCOTOXINS ON VERO CELLS

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian, No 5, Sep/Oct 79 pp 526-529

[Article by N. I. Nagrodnaya, Yu. A Barshteyn and Z. A. Kuratskaya: (THE EFFECT OF FUNGAL TOXINS ON THE MITOTIC REGIMEN OF VERO CELLS) Kiev Scientific Research Institute of Epidemiology, Microbiology and Parasitology, Institute of Microbiology and Virology, Ukrainian SSR Academy of Sciences]

[Abstract] Changes in the mitotic regimen of Vero cells resulting from the exposure to mycotoxins were studied. Mycotoxins in doses of 10 ug/ml and higher were found to be lethal to the cells, therefore a 1 ug/ml dose was used in the experiments. Inhibition of cell mitotic activity was achieved with fumigatin, datulin and dendrodochin. Fusarin, fusaric acid, gelvolic acid and stachybotriotoxin showed no significant effect on the mitotic regimen at this dose. The inhibition of mitotic activity could have been connected with some disorder in the mitotic cycle of the cells. Figure 1, references 19: 11 Russian, 8 Western.
[101-7813]

USSR

UDC: 577.158.54

HIGHLY PURIFIED LUCIFERASE FROM LUCIOLA MINGRELICA FIREFLIES AND ITS KINETIC PROPERTIES

Moscow BIOKHIMIYA In Russian Vol 44 No 10, 1979 pp 1899-1905 manuscript received 20 Mar 79

FILIPPOVA, N. YU. and UGAROVA, N. N., Chair of Chemical Enzymology, Chemistry Faculty of Moscow State University imeni M. V. Lomonosov

[Abstract] Luciferin synthesized in the authors' laboratory was used, as well as EDTA, bovine serum albumin, myoglobin, Reanal (Hungary) ovalbumin, Calbiochem (United States) pepsin and ATP as the material to test activity of luciferase from L. mingrelica, used in a purified state for the first time, as well as to determine the kinetic parameters of the luciferase. Ion-exchange chromatography was chosen to purify this luciferase, and divided precipitation with ammonia sulfate followed by purification on DEAE-sephadex were performed to prevent the loss of activity found at the stage of gel filtration through sephadex G-10. Formulas are submitted to describe the kinetics of action of luciferase. The purified luciferase obtained from L. mingrelica differs somewhat from that of Phophinus pyralis fireflies described before, but both present the same substrate specificity and similar biochemical properties. Figures 3; references 16: 5 Russian, 11 Western.
[76-10,657]

USSR UDC: 577.15.612.015.1

IMMOBILIZATION OF ENZYMES ON BLOOD CELLS BY ADSORPTION

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 249, No 1, 1979 pp 235-237 manuscript received 30 May 79

LEVIN, F. B.; SOROKINA, L. V.; and BEREZOV, T. T., People's Friendship University imeni Patrice Lumumba, Moscow, and Moscow Stomatological Medical Institute imeni N. A. Semashko, submitted by Academician A. Ye. Braunshteyn on 10 Apr 79

[Abstract] Determination was made of the possibility of using human and rabbit blood cells to recover immobilized enzymes, which involves the use of carriers, named biocompatible carriers, for use in medicine and biology. Crystalling glucose oxidase (manufactured at the L'vov Plant), peroxidase and arginase (lyophilized enzymes manufactured by Reanal) were used. Human erythrocytes adsorbed these enzymes much less than rabbit blood cells. Thrombocytes have greater adsorptive capacity than erythrocytes. When bound with blood cells, the enzymes are insoluble, many times more heat resistant, forming a rather stable bond with the cell matrix, and they can be considered immobilized. The nature of the enzyme-blood cell bonds has not been identified, but it is suggested that there is both sorption of the enzyme on the outer surface of the cell wall and immobilization due to incorporation of enzyme molecules in the fine pores of cell membranes. Figures 2; references 11: 6 Russian, 5 Western.
[73-10,657]

USSR UDC: 577.158.45:15.062

INVESTIGATION OF KINETICS OF THE ASPARTATE-AMINOTRANSFERASE REACTION CATALYZED BY FREE AND IMMOBILIZED ESCHERICHIA COLI CELLS

Moscow BIOKHIMIYA in Russian Vol 44 No 10, 1979 pp 1787-1795 manuscript received 8 Feb 79

YAKOVLEVA, V. I., MALOFEYEVA, I. V., FAM VAN NGUYEN and BEREZIN, I. V., Chemistry Faculty and Laboratory of Molecular Biology and Bioorganic Chemistry, Moscow State University imeni M. V. Lomonosov

[Abstract] E. coli strain 85 was the material used; cells thereof were immobilized by incorporation in polyacrylamide gel with chemical polymerization of acryl constituents, and the aspartate-aminotransferase reaction was run under standard conditions. Kinetics thereof was assessed on the basis of accumulation of oxalacetic acid using a Beckman DB-GB spectrometer.

Thin-layer chromatography on Fixion plates was used to identify glutamic acid formed. This is the first publication dealing with recovery of fixed cells with aspartate-aminotransferase activity. The following parameters were determined: kinetics of accumulation of oxalacetic acid in reaction catalized by E. coli cells, kinetics of accumulation of the same acid in aspartate-aminotransferase reaction catalyzed by free cells of E. coli, the same parameter with the use of E. coli cells pretreated with toluene at room temperature, kinetics of oxalacetic acid accumulation during same reaction catalyzed by free, dissociated and fixed E. coli cells, effective rates of the aspartate-aminotransferase reaction and effective constants of equilibrium or stationary state of this reaction, catalyzed by free, dissociated and fixed E. coli cells. This study confirms the possibility of using this reaction to recover L-glutamic acid from L-aspartic acid. Figures 6; references 12: 7 Russian, 5 Western.
[76-10,657]

USSR UDC 547.963.3

USE OF A COMBINED SYSTEM OF TRANSCRIPTION-TRANSLATION TO CLARIFY THE ROLE OF CRYPTIC PLASMIDS OF BACILLUS THURINGIENSIS

Moscow MOLEKULARNAYA BIOLOGIYA in Russian Vol 13 No 6 Nov/Dec 79 pp 1230-1236 manuscript received 12 Dec 78

DEBABOV, V. G., LINDEMAN, L. F., KHLEBALINA, O. I. and KOTOVA, T. S., All Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms, Moscow

[Abstract] Bac. thuringiensis is an industrial producer of entomocide protein, a crystal protein. The latter is a crystalline inclusion in the organism and consists of several proteins, and makes up half of the total protein in the cell. Plasmids have been found (Debabov, 1977) in strains of Bac. thuringiensis which carry the crystal protein; their role is unknown and the present work inquired into the possibility that the plasmids carry the structural gene of the crystal protein. A cell-free system of E. coli transcription-translation was used in this inquiry; the source of the genetic information in it was the Bac, thuringiensis plasmids (Bac. thuringiensis var. galleriae, strain 612). In the cell-free, in vitro synthesis, the DNA of the plasmids of the organism served as a matrix and was shown to possess high matrix activity. However, immunochemical analysis of the polypeptides synthesized in vitro, in the DNA plasmid system, showed that this DNA does not direct the synthesis of the crystal protein. Figures 2; references 17: 5 Russian, 12 Western.
[105-8586]

ADVANCED MEDICAL TECHNOLOGY

UDC 615.371:576.851/.014.41

SURVIVAL RATE OF MICROBES EB IN LIVE PLAGUE VACCINE OF NIIS AND ITS IMMUNOGENICITY IN THE PROCESS OF LONG STORAGE

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 8, 1977 received 31 Dec 76 pp 139-140

/Article by Yu. V. Chicherin, V. A. Lebedinskiy, and V. I. Yevstigneyev/

/Text/ A wide use of live plague vaccines is possible only under the mandatory condition of long preservation of microbes possessing sound immunogenic properties in them. In principle, there is a possibility of long-term storage of the cultures of many microbe species in a dried state without a marked change in their basic properties. However, both the production and practice of use of live plague vaccines still encounter serious difficulties connected with the period of storage of ready preparations. For example, the useful life of the commercial live plague vaccine produced by the institutions of the USSR Ministry of Health preserved at 2-4°C is limited only to 12 months and at 18-20°C, to only 10 days. In other words, even at the present level of means of communication the delivery of a vaccine to the place of use in summertime is associated with great difficulties. In connection with this the development of more effective, new vaccine preparations and methods of use is one of the urgent tasks of the specific prevention of plague.

This paper presents the results of study of the survival rate and immunogenic properties of the live plague vaccine of NIIS /expansion unknown/ in the process of its long storage under conditions of positive (37, 18-24 and 2-5°C) and negative (-20°C) temperatures. The vaccine of NIIS represents a subliminally dried culture of strain EB obtained through cultivation by the deep method. The vaccine does not contain any additives, with the exception of the drying medium, and, therefore, it can be used not only by inhalation, but by epicutaneous and subcutaneous methods as well, that is, in this sense the preparation is universal. Five series of the vaccine stored in vials without vacuum were investigated. The number of live microbes was determined by the method envisaged by interrepublic technical specifications. Before storage the vaccine contained 351 billion live microbes in 1 g (49.2%).

The results of experiments showed that under the tested conditions of storage the plague vaccine in the content of live microbes in it remained a highly conditioned preparation for a long time. Despite the reduction (one-half to one-fourth) in the number of live microbes in the preparation, as compared with the initial number, during the indicated period it remained much higher than the level corresponding to the requirements of interrepublic technical specifications. After 5 years of storage at -20° and 2-5°C the number of live microbes in 1 g of the dry preparation was 132 and 147 billion respectively (the percent of live microbes was 16.7 and 20.8). When the vaccine was stored under conditions of room temperature (18 to 24°C) in 60 days 1 g of the vaccine contained 151 billion (23.4%) live microbes. Microbes EB in the preparation withstood 15-day storage at 37°C. By that time 85 billion microbes (11.7%) survived. According to the existing interrepublic technical specifications-42-68, the vaccine is suitable for use if 1 g contains no less than 50 billion live microbes (not below 10%).

The immunogenic properties of the stored preparation were studied on guinea pigs by inhalation and subcutaneous methods of vaccination. The results of investigations indicated that the vaccine of NIIS was a highly immunogenic preparation not lowering its properties during long storage. The immunogenic properties of the vaccine remained at the tested temperatures for 5 to 5½ years (the period of observation) at a level greatly surpassing the requirements of the official guide, in which the plague vaccine from strain EB is customarily considered immunologically sound if the amount of its ED_{50} does not exceed 20,000 live microbes. In the conducted experiments after 5 and 5½ years ED_{50} totaled $1.63 \cdot 10^3$ and $2.6 \cdot 10^3$ live microbes in animals vaccinated subcutaneously and in animals vaccinated by the inhalation method the amounts of ED_{50} were not lowered by that time. The high immunogenic properties of the vaccine were detected both during a subcutaneous and inhalation infection with the causative agent of the plague.

Thus, the live dry plague vaccine of NIIS prepared on the basis of cultures obtained during deep cultivation can be described as a preparation with a high stability during storage within a comparatively wide temperature range.

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[528-11,439]

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MEDICAL ACADEMY SUMMARIZES VIRUS RESEARCH

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 8, 1979
pp 90-93

[Article: "In the Presidium of the Academy of Medical Sciences"]

[Text] The Presidium of the USSR Academy of Medical Sciences gave audience to a report from V. I. Votyakov, chairman of the Commission on the Problem "Chemotherapy and Chemical Prevention of Virus Infections," on the status of scientific research on this problem and on appropriate applications.

The Presidium of the USSR Academy of Medical Sceinces noted that in the period of accounting, the commission had done a significant amount of both scientific and organizational work. The tasks and goals of the problem "Chemotherapy and Chemical Prevention of Virus Infections" are important and timely. The basic directions of scientific research reflect the most important tasks of modern chemical prevention and chemotherapy of virus infections: research on antiviral substances of synthetic and biological origin--interferon activators playing the role of antiviral substances, the laws governing directed modeling of substances under the control of biomolecular tests; development of the strategy and tactics of antiviral intervention in the presence of acute, chronic, and integrative virus infections; chemical prevention and chemotherapy of ORZ [not further identified] (experimental, clinical, and epidemiological studies), and development of the principles of chemotherapy for influenza and viral hepatitis.

The greatest number of studies being conducted in compliance with the plan of problems and topics pertain to the most important direction of the problem--prevention of virus infections.

In the accounting period (1976-1977), data were obtained opening up new paths for scientific development of antiviral drugs. The methodological approaches to studying and evaluating antiviral agents are undergoing improvement and unification. Much significance is being attached to introduction of new antiviral preparations into clinical epidemiological practice.

One of the most important achievements in chemotherapy and chemical prevention of virus infections is introduction, into public health practice, of remantadin, a preparation with preventive and therapeutic action; improvement of preparations in this chemical series (alkyl derivatives of adamantan, long-acting remantadin, and others) is another highly important achievement. It should be noted that the Pharmacological Committee of the USSR Ministry of Public Health is presently examining preparations from other chemical series which will be introduced into public health practice in the very near future. Twenty-two promising chemical compounds with antiviral properties were awarded inventor's certificates and favorable decisions of the USSR State Committee for Inventions and Discoveries. Giving a generally favorable evaluation to the results of scientific research on chemical prevention and chemotherapy of virus infections, the presidium noted the need for intensifying research on the problem, turning special attention to accelerating introduction of chemical preparations into public health preactice.

The Presidium of the USSR Academy of Sciences gave its approval to work done by the Commission for the Problem "Chemotherapy and Chemical Prevention of Virus Infections" in 1976-1977 pertaining to the planning and coordination of scientific research aimed at intensifying the search for preparations having preventive and therapeutic action among newly synthesized chemical compounds, at thoroughly studying them with the help of the methods of molecular biology, and at introducing antiviral compounds into public health practice.

The Commission for the Problem "Chemotherapy and Chemical Prevention of Virus Infections" (chairman, V. I. Votyakov) recommended: a) unifying the methods used to test antiviral drugs (developing optimum criteria for evaluating antiviral action and determining the range of model viruses and the assortment of cell cultures best suited for use in analysis of chemical compounds); b) continuing research on the chemotherapy and chemical prevention of influenza, using directed synthesis of antiviral agents under the control of biomolecular studies; c) intensifying research aimed at developing experimental models with which to study viral hepatitis; d) intensifying research aimed at developing antiviral drugs out of antimetabolites and derivatives of adamantan, remantadin, and other promising chemical series; devoting some attention to developing combined preparations; e) examining the possibility for using interferon activators in public health practice; f) foreseeing, when drawing up the plans of scientific research to be conducted in subsequent years, integration with institutions and problem commissions dealing with the chemotherapy of bacterial infections and problems concerning the immunology and chemotherapy of tumors, and with the commission for the interferon problem; g) developing and submitting the appropriate proposals to the USSR Ministry of Public Health on the most suitable routes to be taken by antiviral preparations from discovery to introduction into public health practice; h) submitting, to the Council of Scientific Exploration of the USSR Academy of Medical Sciences Presidium, a plan for publication of information on the problem and research instructions and methods for 1979-1980.

The Presidium of the USSR Academy of Medical Sciences gave audience to a report from V. M. Zhdanov, chairman of the USSR Academy Sciences Presidium's Scientific Council on the Problems of Virology and Viral Diseases, on progress in the integrated program of coordinated influenza research in 1976-1980. The Presidium of the USSR Academy of Sciences noted that 41 institutes and 50 research centers of the all-union and regional influenza centers took part in the research.

In the "Strain,Collective Immunity, and Laboratory Influenza Diagnosis Service" section, information is regularly exchanged on morbidity and the results of influenza diagnosis between the regional center, its research centers, and the USSR Ministry of Public Health All-Union Scientific Research Institute of Influenza. Foreign ties are maintained with WHO, with international influenza centers in London and Atlanta, and with countries of the socialist fraternity. The upper tolerance limits of daily morbidity in the influenza season in Moscow have been plotted. Methodological recommendations have been written for use by the Moscow City Epidemiological Station to determine the starting time of influenza epidemics. Information on surveillance over the movements of epidemics throughout the entire planet has been improved. Diagnosis by center laboratories has been intensified, which made it possible to accelerate determination of the etiology of influenza epidemics.

In the "Structure, Reproduction, and Genetics of Influenza Viruses" section work is being done in compliance with treaties signed between the USSR and the USA, and between the USSR and Great Britain. Polypeptides and ribonucleoproteins from different strains of human and animal influenza virus have been studied relatively well. The laboratories have obtained membrane protein from influenza virus and monospecific serum against it, labeled with radioactive iodine; this serum can be used to diagnose and study the antigenic structure of different strains and to detect membrane protein in cell preparations. A competitive radioimmunological method (radioimmunoassay) using viral hemagglutinin has been set up.

In the "Reproduction of Influenza Viruses" section presence of two virus specific structures has been demonstrated in nuclei in the early stages of infection. An acellular system of RNA synthesis, in which both of these structures function actively, has been set up.

It was demonstrated with actinomycin D that all viral information RNA possesses identical stability and life span.

It was demonstrated with the help of a pulsating label and by means of subsequent replacement of labeled precursor by unlabeled precursor ("chaser") that all viral polypeptides, except for the hemagglutinin of severed chains, are primary translation products.

In the "Causes of Nonpermissivity of Cells to Influenza Virus" section, it was established through relative study of influenza reproduction in sensitive and nonsensitive cells that a nonpermissive cell system differs from a permissive system in that the viral membrane protein is absent from cell membranes and that nucleocapsids have unusual conformation and are uncoiled.

In the "Influenza Virus Ecology" section work is proceeding according to the plan of the USSR Council of Ministers State Committee for Science and Technology in compliance with the WHO program. The work is proceeding in accordance with treaties signed between the USSR and the USA, between the USSR and GDR, and between the USSR and Mongolia. A system of research centers located in all physicogeographic regions of the country has been created. Instructions for standardizing the methods of collecting and processing field materials have been published.

Circulation of swine influenza viruses among swine has been checked out in the USSR. They were shown not to be circulating on USSR territory, except in Gor'kovskaya Oblast. Information was obtained on circulation of epidemic influenza viruses in the Hong Kong complex among domestic and wild animals and birds. Nine different influenza viruses were isolated from wild birds on USSR territory, two of them for the first time. One of the isolated viruses contains hemagglutinin identical to that of epidemic Asiatic virus that had ceased circulating among people in 1968. Research has been started on recombination between animal and human influenza viruses. Diagnostic preparations have been sent to the research centers to permit them to classify the strains they isolate.

In the "Chemotherapy and Chemical Prevention of Influenza" section, a new selection model has been set up to study the action of compounds against influenza virus in a cell culture. New correlations were revealed between the chemical structure of compounds in the adamantan series and their anti-influenza activity. The activity of a new compound containing an adamantan ring was established in animal experiments. The advantage of using combinations of remantadin and influenza vaccine was experimentally validated. Remantadin effectively suppresses synthesis of influenza virus protein and formation of virus-specific polyribosomes. Research has been conducted on the therapeutic effectiveness of remantadin, and its doubtless therapeutic action has been proven.

Research has been conducted in the "Preventive Vaccination" section on peroral immunization of volunteers with live influenza tissue monovaccine A, which exhibits positive serological changes in relation to virus-neutralizing, antihemagglutinating, and antineuraminidase antibodies. Production processes are being developed for mass production of killed inactivated vaccines. The techniques to be employed include adsorption on large-pore glass and continuous centrifugation.

In the "Immunology and Pathogenesis" section, possibilities for isolating viral antigens from blood lymphocytes and from their individual subpopulations have been studied. Approaches to studying the nature of the antigens revealed and the dynamics they undergo in the process of infection and vaccination are being developed.

In the "Clinical Pattern and Treatment" section, an analysis was performed in 1976 of the clinical course of influenza elicited by different variants of A2 influenza virus (England 42/72; Port Chalmers/1975; Victoria/75); it was demonstrated that influenza virus Victoria/75 elicited pronounced toxicosis, the hemorrhagic syndrome, and development of severe forms in a fewer number of patients. The main criteria for the dominant role played by viral or bacterial infection in the course of illness were revealed. The clinical course of influenza elicited by B virus was analyzed; it was typified by more-pronounced symptoms of toxicosis and hemorrhagic manifestations, and by an increase in the incidence of severe forms.

Clinical virological research revealed RS [not further identified] virus influenza, adenovirus, mycoplasmic, and herpetic infection. The role of staphylococcal infection in the arisal of postinfluenza complications is increasing significantly.

Research was conducted on the unique features of the clinical course of croup in children suffering different acute respiratory viral diseases. It was noted that croup develops most often in the presence of parainfluenza, adenovirus diseases, and mixed respiratory viral diseases.

The generalized results of testing the therapeutic effectiveness of remantadin against experimental viral infection on volunteers and influenza patients earned the prize of the USSR State Committee for Science and Technology.

The suitability of using aminazin against the neurotoxic syndrome, diaphylline against the acute bronchial obstruction syndrome, and combinations of semisynthetic penicillins against pneumonia was demonstrated.

Implementation of the All-Union Integrated Program of Coordinated Scientific Research on Influenza in 1978-1980 made it possible to achieve closer ties with the working level, expressing themselves as systematically conducted seminars and working conferences; this program also made it possible to plan subsequent research more clearly and introduce the obtained results into practice more quickly.

Shortcomings were also revealed in the program: The research centers and laboratories were still lacking equipment (Plexiglas boards for titration, automatic syringes, pipettes, and so on). Interruptions are observed in the supply of required mediums (Igla medium, medium No 199, and others) and diagnostic preparations (standard diagnostic, not containing serum inhibitors, and others). The work of the research centers must be subjected to regulation. It was decided to ask the USSR Ministry of Public Health to accelerate preparation of the appropriate order.

The Presidium of the USSR Academy of Medical Sciences also gave audience to information from V. M. Zhdanov on arisal of influenza virus A1 (H_1N_1) on USSR territory in different regions of the country. It has already elicited a number of outbreaks, and it exhibits a tendency toward epidemic spread. The question of possible preventive measures was also discussed.

The Presidium of the USSR Academy of Medical Sciences asserted that scientific research on influenza is being conducted in compliance with the integrated program of coordinated research on influenza in 1976-1980.

V. M. Zhdanov, chairman of the Scientific Council on Problems of Virology and Viral Diseases, was ordered to periodically adjust the integrated program of coordinated influenza research with a consideration for the scientific research results.

It was recommended to appropriate services of the USSR Ministry of Public Health that they organize manufacture of influenza vaccines (live and killed) out of newly isolated A1 (H_1N_1) influenza virus strains, accelerate certification of the remantadin preparation for mass production, and use the interferon preparation in antiepidemic measures.
[525-11004]

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THIRD MONGOL-SOVIET SCIENTIFIC CONFERENCE

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian Vol 48 No 4 Jul/Aug 79 pp 83-84

/Article by V. F. Popov and G. Zhamba/

/Text/ The Third International Scientific Conference of Specialists in Especially Dangerous Diseases of the Mongolian Peoples Republic (MPR) and of the USSR took place in December 1977 in Ulan-Bator, the capital of the MPR.

For the third time, representatives of the scientific workers in plague control institutions have met to discuss in detail the results of cooperative research, to share experience in the work and to mark ways for further cooperation in the field of epidemiology and prophylaxis of diseases with natural foci.

Cooperation of the two countries on study and prophylaxis of these diseases has a long-standing tradition which arose even in the last century. In this connection, it is impossible not to recall the remarkable Russian physicians headed by the prominent scientist D. K. Zabolotniy who initiated study of plague on the territory of Mongolia. Especially close cooperation of Soviet and Mongolian medical workers was established after the peoples' revolution. In 1930, for the first time in history, a treaty was signed between the two governments "On Joint Work in Control and Prophylaxis of International Quarantine Infections", serving as the firm basis of our subsequent many-years cooperation. In 1931, a fully staffed plague control laboratory was opened in Ulan-Bator--a gift of the Peoples Commissariat of Health of the RSFSR in honor of the Tenth Anniversary of the Mongol peoples' revolution. The first director of the laboratory was the noted Soviet scientist A. L. Berlin. Later, in the facilities of this laboratory, there was organized an Institute of Especially Dangerous Diseases. In the course of an extended period of time, work was carried out in the plague control institutions of MPR by the highly qualified Soviet specialists A. Ya. Dudukalov, A. K. Borzenkov, L. P. Urazova, L. M. Maksimov, A. S. Soboleva, V. P. Smirnov, P. P. Tarasov, G. S. Letov, M. P. Kozlov, Ye. K. Zav'yalova and many others. They provided great help in preparation of national cadres and also took an active part in the practical work and further improvement of plague control organizations of the MPR.

At the present time the MPR has highly qualified national cadres, it has organized an orderly system to combat especially dangerous diseases. Thanks to the great prophylactic work, epidemiological wellbeing has been seen steadily in the MPR over the course of many years.

The scientific conference was dedicated to the Great October Socialist Revolution. Participating in its work was more than 150 scientific and practical workers in MPR public health. The Soviet Union was represented by 15 scientists including such noted specialists as Professors V. V. Kucheruk, N. V. Nekipelov, I. F. Zhovtyy, L. A. Timofeyeva, A. K. Akiyev and others.

Over 30 reports were presented at the conference and a collection of the conference subject materials was printed. In the opening report, L. M. Marchuk, G. Ochirvan', A. D. Safonova and D. Galbadrakh presented the results of the joint work and defined the tasks for the future. In 1974-1976, joint research was carried out in 6 of the 8 MPR aymaks bordering on the USSR. Observations were made on a territorial area of 1560 thousand hectares; bacteriological examinations were carried out on 17,024 mammals and 106594 ectoparasites; 24695 serological reactions were performed. It proved possible to isolate causative agents of a number of diseases and to define their distribution. For the first time on the territory of the MPR there were found causative agents of tularemia, pseudotuberculosis, pasteurellosis and erysipeloid. Findings were presented of a study of the species composition of flea vectors of the causative agents of plague, lice and other ectoparasites of rodents, ixodide, gamaside and spinning [thrombidiidae] ticks. Biological bases were worked out for a procedure to eradicate fleas; approval has been granted for deep dusting, under industrial conditions, of burrows with chloroorganic insecticides. Study has begun of the etiologic structure of brucellosis foci, discovery and treatment of soil foci of anthrax in the MPR.

A number of reports, presented by N. V. Nekipelov, A. K. Akiyev, Sh. Khishgee, were devoted to epidemiological survey and to devising of measures to prevent plague on contiguous territories. Several reports (L. A. Timofeyeva, P. Zham'yansuren, S. P. Merinov, O. Munkhtuyaa, S. Tsevelmaa, A. Bavaasan) examined bacteriological and serological methods of plague diagnosis and also presented results of study of the ecology of fleas parasitizing Mongolian rodents.

Great interest was evoked by the report of V. V. Kucheruk, et al., "Discovery, on the Territory of the MPR, of Natural Foci of Tularemia and Plague, with the Aid of Study of Leavings of Predatory Birds". Tularemia antigens were found in 22 leavings, collected on the territory of 6 aymaks. Leavings with an antigen were found in a forest steppe, zonal steppes and, also, on the border of zonal and desert steppes. This procedure made it possible also, to find antigens of the plague microbe on the territory of a number of aymaks. The results obtained point to the expediency of broad use of examination of leavings of predatory birds to expose an epizootic situation in natural foci of tularemia and plague on the territory of the MPR.

In the course of discussion of the materials presented at the conference, basic directions were defined for joint studies. In particular, there was examined a regular implementation of interchange of information on epizoological situations in natural foci of plague in the MPR and USSR, continuation of joint study of the spatial and bioceonotic structure of plague foci and their epidemic potential. It is necessary to devote special attention to study of the mechanisms of maintenance of the plague microbe in the interepizootic years and, also, to devising more effective methods of prognostication and prophylaxis. Further study was proposed of the specifics of strains of the plague microbe, which have been isolated in natural foci of the Altay, Khangay Khentey and Dauria.

Using the many-years experience of cooperation of Soviet and Mongolian specialists, it is necessary to enter upon a joint study of the features of the epidemiology, epizootology, a devising of measures to prevent tularemia, brucellosis, anthrax and several virus infections under the specific conditions of the MPR. Publication is foreseen of a joint methods handbook on epidemiological inspection in contiguous natural foci of plague, exchanges of specialists for work in epidemic-prevention brigades and scientific expeditions. Training is planned for Mongolian specialists at a facility of plague control institutes of the Soviet Union.

The scientific conference which has taken place has once again demonstrated the filial, close cooperation of the scientists and practical workers of both countries. There is no doubt that further extension of cooperation of medical workers of the USSR and MPR will promote strengthening the health of their populations.

[324-8586]

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SOME INDICES OF A SYSTEM OF THERMAL REGULATION DURING ADAPTATION TO COLD UNDER POLAR CONDITIONS

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 5 No 5, Sep/Oct 79 pp 931-933 manuscript received 10 Jul 77

YAKIMENKO, M. A., TKACHENKO, YE. YA., DIVERT, V. E. and FIL'KO, O. A., Institute of Clinical and Experimental Medicine, Siberian Branch of the USSR Academy of Medical Sciences, Novosibirsk

[Abstract] Inhabitants (males, aged 20-30) of Norilsk who had lived there no less than two years were the subjects of this study; two groups were involved, one which worked in the open air and another which worked in a heated area. Heat loss from the skin surface was measured by the weighted mean temperature of the skin. Integral indication of heat production in the body involved recording of total oxygen demand. Heat formation in skeletal musculature was measured by value of the electrical activity of the trapezius muscle. Measurement of the temperature center of the body was made in the external auditory meatus, 1-2 mm from the eardrum. Exposure to the extended action of cold lowered the weighted mean temperature of the skin, the level of thermoregulatory contractile activity of the skeletal muscles and the thermoregulatory increment in oxygen requirement. The adaptation was seen to involve lowering of the energy use mechanism lower temperature homeostasis in man. Small increments in oxygen demand, as low as 9-10%, were accompanied by intensification of the thermoregulatory contractile activity of muscles. References 13: 8 Russian, 5 Western.
[526-8586]

USSR UDC 612.82+612.17-612.46.7015.31.-003.96-019:599.323.4] (23)

EFFECTS OF MOUNTAINOUS CLIMATE ON BRAIN, HEART, AND KIDNEY ELECTROLYTE BALANCE IN RATS

Frunze IZVESTIYA AKADEMII NAUK KIRGIZSKOY SSR in Russian No 4, 1979 pp 48-54 manuscript received 9 Jan 79

(ALIYEV, M.A.; CHERNOOK, T.B.: KOSTYUCHENKO, L.S.; and LEMESHENKO, V.A.; Institute of High Altitute Physiology and Experimental Pathology, Kirgiz SSR Academy of Sciences)

[Abstract] Evaluations were made of physiological adaptation, in terms of electrolyte balance, of 180-200 g white male rats brought to an altitude of 1600 m at Issyk-Kul' and maintained there for a period of 40 days. Control data were obtained by use of rats maintained in Frunze. Determinations of

the K+ and Na+ values showed mean control values (in meq/100 g) of 16.6 and 28.1, respectively, for the midbrain; the respective values after 10, 20, 30, and 40 days in Issyk-Kul' were 16.0 and 11.1, 24.7 and 12.4, 19.6 and 7.5, and 29.0 and 22.4. In the case of the cerebral cortex, K+ and Na+ control values were 19 and 32.5; at the corresponding periods of adaptation the mean values were 14.1 and 12.5, 21.0 and 13.1, 24.3 and 9.4, and 36.7 and 23.2. These findings were interpreted to indicate adaptive changes and were tested by exposure of the animals to an altitude of 12000 m at a rate of 25 m/sec, or induction of thrombocyte aggregation by injection of 2.0 mg/kg of reserpine. In both situations, fluctuations in Na+ and K+ were mitigated to a degree corresponding to the length of adaptation at Issyk-Kul'. Somewhat analogous general findings pertained to the heart and the kidneys, which supported the contention that the changes induced in tissue K+ and Na+ levels by prolonged exposures to elevated altitudes represent adaptive parameters. References 10 (Russian).
[80-12172]

USSR UDC 612.577.462

YEARLY RHYTHMS OF THE CONTRACTILE FUNCTION OF THE HEART AND OF SOME INDICES OF CARDIAC METABOLISM

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 249 No 2 1979 pp 504-508
manuscript received 8 Jun 79

FROLOV, V. A., YEFIMOVA, L. V., KAZANSKAYA, T. A. and KOZYRENKO, V. N.,
University of Friendship of Peoples imeni Patrice Lumumba, Moscow

[Abstract] Citing several Soviet reports that circadian, seasonal and year-related biorhythms can affect the course of physiological and pathological bodily processes--possibly influencing outcome of disease or efficacy of therapy--the present article describes an experimental study--on chinchilla rabbits--of yearly rhythms of several very important aspects of cardiac activity. Measured were blood diastolic pressure in the aorta, peak systolic blood pressure in the cavity of the left ventricle during occlusion of the ascending aorta with subsequent calculation (Frolov, et al., 1975) of the coefficient of potential work capacity of the myocardium. Also assayed were content of free fatty acids in the blood, and lipoproteidlipase, triacylglycerolipase and monoacylglycerolipase activities, and myocardial fiber width. These data were collected in each month of the year and are tabulated. Data were processed on computers M-4030 and T1-58 and a simple analytical expression of the yearly rhythm of cardiac contractile power was derived and expressed as a mathematical function. The myocardium was functionally most effective in the period from beginning of spring to mid-summer, and least adaptive to load in the period from summer end to mid-winter. Figures 2; references 10: 7 Russian, 3 Western.
[110-8586]

USSR UDC 612.014.461+612.460

KIDNEY ADAPTATION TO HIGH ALTITUDES

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 5 No 5 Sep/Oct 79 pp 849-854
manuscript received 22 Dec 77

KOROL'KOV, V. I., DOTSENKO, M. A., GRIGOR'YEV, A. I. and KOZYREVSKAYA, G.I.: "WWTER AND SALT EXCHANGE AND HUMAN KIDNEY FUNCTION AT HIGH ALTITUDES," Moscow

[Abstract] Differences which appear in individuals living in high mountain areas--with respect to lowered body weight, volume of circulating plasma, polyurea, excretion of electrolytes and osmotically-active substances, dehydration, shifts of water from intracellular to extracellular spaces--are cited. It is pointed out that these are found in individuals who normally reside at the high altitudes. The present article describes study of individuals who were gradually adapted to high altitude conditions. Six healthy males, 18-25, with the same level of training and resistance to hypoxia were subjected to an "ascent" in a barochamber to a height of 5000 m, with a 30-minute exposure. This was done over a 10-day period in a clinic of the Kirgiz State Medical Insitute in Frunze. Then the six were transported to a 2200 m height and, after this, to a 3200 m height--staying 12 days at each height. No special exercises were done at these times, and the six were returned for 10 days at the Frunze hospital. Daily calory intake was 3000 kcal; water intake was at will. Tests run included body weight, serum and urine Na and K, blood and urine osmotic concentration, gas exchange, acid-base equilibrium, hematocrit, circulating plasma, blood and urine creatinine, plasma renal flow, water intake and urine excretion. Under high altitude conditions, a relative increase was recorded in renal water losses and a decrease in water requirement, rise in rate of excretion of osmotically-active substances and sodium (especially at 3200 m); no substantial increase in rate of glomerular filtration or plasma flow was noted. Neuroendocrine regulation of water and salt exchange was reflected in a decrease in production of antidiuretic hormone and aldosterone. There was seen an increase in volume of circulating blood and erythrocytes, but essentially no change in volume of circulating plasma. The gradual adaptation apparently helped to prevent hypo-hydration. Figures 4; references 26: 8 Russian, 18 Western.
[526-8586]

USSR UDC 611.12:612.89

NOVIKOV, I. I., Institute of Physiology, Academy of Sciences Belorussian SSR

DEVELOPMENT OF HEART VALVE INNERVATION IN THE WHITE RAT

Minsk DOKLADY ADADEMII NAUK BSSR in Russian No 11, 1979 pp 1048-1051

[Abstract] Histochemical and fluorescent studies were conducted on the heart valves of embryonic, neonatal, young, and adult Wistar rats to determine the course and sequence of innervation. The results indicated that innervation commences during the first week of extrauterine life and that the process is essentially completed by the first month. Innervation was particularly pronounced in the case of the cuspid valves and suggested the presence of an intracardiac relfexogenic zone. In addition, rich adrenergic innervation was interpreted to indicate that the heart valves participate in catecholamine metabolism. Figures 2; References 10: 4 Russian, 6 Western.

[133-12172]

USSR UDC 615.33.035.4

EARLY ANTIBIOTIC USE IN MILITARY MEDICINE

Moscow ANTIBIOTIKI in Russian No 11, 1979 pp 873-875

[Article by Vspenskaya, T.A.: "Problems of Prophylaxis and Early Antibiotic Use (Plenary Session of the Committee on the Problems of "Antibiotics and Other Biologically Active Substances"), Moscow]

[Abstract] The plenary session on the prophylactic and early use of antibiotics was organized by the Institute for the Preparation of New Antibiotics of the Academy of Medical Sciences USSR and was held on April 16, 1979. The meeting was opened by Academician G.F. Gauze, who reported on international congresses and emphasized the need for early administration of antibiotics. G.K. Alekseyev spoke on "Certain Asepcts of the Use of Antibiotics" in which he emphasized prophylactic administration, and YU.G. Shaposhnikov and YE.A. Reshetnikov (Military Medical Faculty, Central Institute of Postgraduate Medicine, Ministry of Health USSR) covered the use of prophylactic antibiotic therapy in soldiers with open wounds under battle conditions. Other speakers on related themes includes YE.YE. Gogin, YE.S. Tikhomirov, V.G. Alekseyev, A.A. Khizhnyak, and N.V. Yefimov on antibacterial therapy of acute pneumonia, A.M. Marshak on the early use of antibiotics in surgery, and V.M. Mel'nikova on the use of antibiotics in various conditions that may result in gangrene.

[134-12172]

USSR

PROSTAGLANDINS: LEGENDS AND REALITY

Riga NAUKA I TEKHNIKA in Russian No 6, Jun 79 pp 20-21

Dikovskaya, Klara Ivanovna and Freymanis, Yanis Fritsevich, Prostaglandin Chemistry Laboratory, Institute of Organic Synthesis, Latvian SSR Academy of Sciences

[Abstract] Prostaglandins are bioregulators which have important uses in medicine and in livestock raising (regulation of fertility cycles, curing of barrenness, aborting karakul sheep to obtain unborn hides, increasing caviar production). Some 20 naturally-occurring prostaglandins are known, and chemical syntheses of some of them have been carried out. Currently interest focuses on prostaglandin homologs which do not occur in nature; some of these are not "recognized" and broken down by enzymes in the cell, so that their effects can last much longer. Some examples are 15-methyl PCF_2 and the PGF_2 analogs "equamate" and "extrumate," which surpass the activity of the natural compound by 10 and 100-200 times respectively. Prostaglandins are converted by enzymes into endoperoxides such as PGG_2 and PGH_2, which form thromboxanes in thrombocytes. The endoperoxides are also converted by enzymes to prostacyclins, which are secreted by blood-vessel walls when in contact with thrombocytes and which prevent their accumulation. Prostaglandin with cycloadenosine-3',5'-monophosphate has a central role in many regulatory mechanisms. The USSR is conducting the "Prostaglandin" all-union research project. PGE_2 is being biosynthetically produced by the Institute of Chemistry, Estonian SSR Academy of Sciences. Medical requirements for it are expected to be satisfied in the future. The Institute of Organic Synthesis, Latvian SSR Academy of Sciences, is working on a total chemical synthesis of prostaglandins so as to produce larger quantities in its experimental plant. It has produced 11-desoxy PGE_1, with a physiological activity comparable to PGE_1; this is being supplied to scientists for study. The Latvian Scientific Research Institute of Livestock Raising and Veterinary Medicine is studying the biological activity of these compounds. Figures 2.
[37-8480]

USSR UDC 541.69+577.150.4+577.15/17+612.014.462+612.015+615.011

PRINCIPLES IN CLASSIFYING PHYSIOLOGICALLY ACTIVE SUBSTANCES

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 5, Sep-Oct 79 pp 732-737 manuscript received 6 Apr 79

GLADKIKH, S. P., DMITRIYEVA, M. V., NIZHNIY, S. V., PIRUZYAN, L. A. and PODYMOV, V. K., Scientific Research Institute for Biological Testing of Chemical Compounds, Moscow

[Abstract] The usual methods of classifying physiologically active substances are unsuitable largely because the characteristics used as classifying features are based mainly on the clincial features of the therapeutic effect. To use these methods in screening systems, they should provide clear information from each level of the biological tests, from physicochemical to the total organism. A different approach is suggested for problems of classification of physiologically active substances with regard to the principles of interaction of the agent and target, i.e., on the mechanism of the effect. The organizational hierarchy of biological objects and functions of main systems is given from the molecular and submolecular to the systems level. Physiologically active substances are themselves classified as receptor types which act at the macromolecular and submolecular level and biochemical types which act as metabolites and chelate forming substances. The types of physiological activity for screening physiologically active substances at all levels of investigation and types of pharmacological and therapeutic activity may be classified as indirect only at a fundamental level such as the molecular level of the organism. To demonstrate the effect of physiologically active substances at the cellular level, caffeine in concentrations of 5.10^{-6} to 2.10^{-2} M revealed a two-phase effect on an isolated strip of myocardium of the frog. A brief increase in the amplitude of contractile responses without appreciable variation of the cellular potential of action was common for the first phase. The length of the potential of action decreased and the contractile activity was suppressed in the second phase. It was determined that caffeine significantly increases the Ca-current and reduces the threshold of its activation on a background of blockading the first channels by tetrodotoxin during the first phase. The slow component of the caffeine-modified incoming current is suppressed by D-600 compound. The electrical and contractile activity of the myocardium, completely suppressed by tetrodotoxin, is restored by caffeine and is not restored upon suppression of the Ca-current when using compound D-600. The results indicate that the effect of caffeine is related to its effect on the Capermeability of the cellular membrane and also the membranes of intracellular calcium pellets. The described effects differ significantly from the action of catecholamines on the same object and caffeine-possibly interacts with the so-called adrenergic receptor and has a different target distinct from it as well. The basis of the various types of physiologically active substances is physiochemical processes related to restructuring, variational

redistribution of the forces which stabilize the structure or individual fragments of the target due to the influence of the appropriate agents. Further development of the concepts on the mechanisms of changes in the tertiary, quaternary structure of active reception centers and catalytic centers of enzymes will lead to further differentiation of the mechanisms within each of the groups of physiologically active substances. All the mechanisms will be realized jointly at the cellular level and separation of them into components is rather arbitrary. The given systemization is suitable for working out models acceptable at the primary stage of selecting physiologically active substances by the forecasting principle. The differences of physiologically active substances within a group may be related to the characteristics of the effect of processes in which physiologically active substances participate on kinetic or equilibrium parameters. This also causes a difference in the methodical approaches to determining the main features of action of substances suitable under screening conditions at each of the organizational levels. References 7: 7 Russian.
[17-6521]

USSR UDC 612.821

POSSIBILITY OF DETERMINATION OF DIRECTION OF INFORMATION TRANSMISSION IN NEURAL NETWORKS

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 5 No 5 Sep/Oct 79 pp 942-944 manuscript received 30 Sep 78

ANNARAUD, D. K., MATVEYEV, YU. K. and USOV, V. V., Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] A method is suggested to identify the direction of information transmission in neuron ensembles in order to study changes in the neuronal communications. The basic idea of the method consists in examining, successively, two hypotheses; the first hypothesis suggests that a single event in a pulse current, B, is the sequela of single events in current A. A diagram of this hypothesis presented, wherein the events in current B are depicted as fully determined by events in current A (thus, a single pulse in A is followed by a discharge in B). The second hypothesis is the antithesis of the first. In the article's approach to this study, two fields of simultaneous neuron events were constructed in correspondence with these two hypotheses [the procedure for such construction is referenced but the reference itself is, in fact, not supplied in this article]; on the basis of the procedure it is apparently possible to identify forward and reverse, two-way, directions in the transfer of information. The procedure was used to study spontaneous activity of a pair of neurons, the activity being recorded by one or two microelectrodes. Spikes of the separate neurons were isolated by amplitude discrimination. Figures 2; references 7: 5 Russian, 2 Western.
[526-8586]

USSR UDC 616.12-009.72-085.849.19

TREATMENT OF ANGINA PECTORIS WITH HELIUM-NEON LASER

SHASTIN, N.N., AGOV, B.S., ZHUK, A.YE., and NIKOLAYEVA, R.I., Faculty

Moscow KLINICHESKAYA MEDITSINA in Russian No 19, 1979 pp 42-46

Chair of Therapy, Leningrad Sanitary-Medical Institute

[Abstract] Red light provided by a helium-neon laser (0.6328 um wavelength, 20-30 mW; 15-20 30 sec sessions), applied to the chest wall, was tested for therapeutic efficacy in the case of 66 male and female patients with angina pectoris, ranging in age from 40 to 76 years. Sixteen of the subjects received laser therapy alone, while 50 were also maintained on their regular drug regimen. Evaluation of the subjects showed that a positive therapeutic effect was obtained in 81.8% of the patients, espeically in those with lighter forms of angina pectoris. This was manifested by a decrease in the frequency of anginal attacks, shorter duration of pain, and greater tolerance of physical stress. In 75% of the cases improvements persisted for six to ten months. None of the subjects exposed to ordinary red light employed as a control evidenced any degree of improvement. Tables 1; References 8: 1 Western, 7 Russian.
[528-12172]

USSR UDC 611.71:539

MATHEMATICAL MODEL OF BONE TISSUE AS A POROUS, RESILIENT PIEZOELECTRIC MATERIAL

Riga MEKHANIKA KOMPOZITNYKH MATERIALOV in Russian No 5, 1979 pp 851-855

[Articel by Yu. A. Avdeyev and S. A. Regirer, Institute of the Mechanics, Moscow State University Imeni V. V. Lomonosov]

[Abstract] A model of a porous material filled with piezoelectric fluid was proposed for the studies of bone tissue. A two phase statistically homogeneous system was analyzed consisting of a solid skeleton with piezoelectric properties and a viscose electrolyte filling the pores. The skeleton and the medium were anisotropic. Mass exchange between phases leading to a change in porosity was considered disregarding the diffusion and chemical reactions inside these phases. The analysis was limited to equal and constant phases of real density at identical phase temperatures and small skeleton deformations. The equations developed represented important characteristics of bone tissue: piezoelectric and pyroelectric effects, shifts

of the electrolyte in the pores, and ability to readjust under the influence of an electric field. When it is possible to disregard irreversible deformations and the effects of the changes in real density, these equations could be used for situations of a short lasting load on bone samples with rather high deformation rates. References 8: 4 Russian, 4 Western. [94-7813]

USSR UDC 615.361.12.041.41

PATHOPHYSIOLOGIC FEATURES OF BIOLOGICAL HEART PRESERVATION BY ROBICSEK'S METHOD

Moscow PATHOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTAL'NAYA TERAPIYA in Russian No 5, 1979 pp 15-20

BARINOV, E.F., Chair of Operational Surgery and Topographic Anatomy, Donetsk Medical Institute imeni M. Gor'kiy, and the Gor'kiy Medical Institute imeni S.M. Kirov

[Abstract] Hemodynamic and histochemical studies were performed on heart-lung preparations of 40 dogs, in order to evaluate the pathophysiological aspects of Robicsek's method of heart preservation in absence of biochemical supportive measures. The survival time of the heart of 2-3 h under these conditions was determined by the development of pulmonary edema and hypertension, as well as right and left ventricular failure which curtailed adequate heart perfusion. Figures 3; References 12: 3 Western, 9 Russian. [119-12172]

USSR UDC 615.372:576.851.315/.032.3

ORAL CHEMICAL VACCINE FROM A TOXIGENIC STRAIN OF V. CHOLERAE, SEROVAR OGAWA. (AN EXPERIMENTAL STUDY)

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 10 Oct 79 pp 62-68 manuscript received 30 Oct 78

DZHAPARIDZE, M. N., KARAYEVA, L. T., SUMAROKOV, A. A., PAVLOVA, L. P., MARCHUK, L. M., NAUMOV, A. V., POPOV, A. A., NIKITINA, G. P., IGONINA, N. B., YABLOKOVA, L. N. and KOTKINA, T. A., "Mikrob" All-Union Scientific Research Plague Control Institute, Saratov

[Abstract] Earlier, this institute had developed a chemical, tabletted vaccine, from strain No 569B V. cholerae of the Inaba serological type, for testing on volunteers in oral proprylaxis of cholera. It had been tried

in Bangladesh and the Philippines, whereupon the WHO concluded it was necessary to include--in cholera vaccines--antigens of both Ogawa and Inaba serological types since cross protective reactions between the two types were not indicated. The present article describes trials of a chemical, tabletted vaccine prepared from a centrifugate of a broth culture of strain No 41 p of V. cholera, serovar Ogawa. The subculture had been isolated [inferentially, by the authors' institute] from the vaccine strain No 41. Preparation details and standardization procedures are cited and substantiated. Using rabbits as test animals it was demonstrated that the oral vaccine was qualitatively equivalent--with respect to its low residual cholerogenicity and toxicity--to the oral vaccine from the strain No 569B whose safety and areactogenicity for people had been shown (see above). The oral vaccine was able to evoke, when administered intra-enterically, in rabbits, the formation of antitoxins and vibriocidic antibodies. Figure 1; references 17: 7 Russian, 10 Western.
[104-8586]

USSR UDC 615.332(Bleomycinum)].015.4.076.9

GOL'DBERG, L.YE., SHEPELEVTSEVA, N.G., VERTOGRADOVA, T.P., STEPANOVA, E.S., MURAVEYSKAYA, V.S., BELOVA, I.P., and FILIPPOS'YANTS, S.T., Institute for the Preparation of New Antibiotics, Academy of Medical Sciences USSR, Moscow

PHYSIOLOGICAL EFFECTS OF SOVIET BLEOMYCIN--BLEOMYCETIN--ON MULTIPLE PARENTERAL ADMINISTRATION

Moscow ANTIBIOTIKI in Russian No 11, 1979 pp 847-853

[Abstract] Preclinical studies were conducted on chronic toxicity of bleomycetin--Soviet bleomycin--using rats (intramuscular administration), rabbits (intravenous), and dogs (intravenous). The use of various dosages and schedules demonstrated that the primary cause of death was glomerulonephritis, with possible secondary contributions from pulmonary involvement. The hematopoietic system and the liver were not involved, and changes noted on the EKG may have been due to pulmonary malfunction. The lack of hematopoietic effects distinguishes bleomycetin from the majority of antineoplastic agents. Tables 2; References 8: 2 Western, 6 Russian.
[134-12172]

USSR UDC 612.017.4:612.815.2

PRODUCTION OF AN ANTISERUM TO NEUROTOXIN-2 FROM VENOM OF COBRA NAJA NAJA OXLANA AND ITS INTERACTION WITH THE TOXIN

Leningrad ZHURNAL EVOLYUTSIONNOY BIOKHIMII I FIZIOLOGII [Journal of Evolutionary Biochemistry and Physiology] in Russian No 5, 1979, submitted 16 May 78, signed to press 28 Aug 79, pp 543-545

BORTNIK, A.T., and ROZANOV, S.I., Department of Problems of Memory of the USSR Academy of Sciences Institute of Biological Physics, Pushchino

[Abstract] An attempt to use immunochemical methods for detection of neurotoxin-2 from the Central Asia cobra (Naja naja oxiana), bound with acetylcholine receptors of the end plates of mouse diaphragm involved procurement of the neurotoxin-2 by immunization of Chinchilla rabbits by injection of 0.25 ml of the toxin directly into the popliteal lymph nodes and reimmunization 1 month later by injection of 10 mg. of the toxin in 1 ml of physiological solution into the limbic vein of the ear and by 5 mg. intramuscularly. In spite of the high sensitivity of the method strict specificity of the antiserum for the toxin and its interaction with NT-2 both in vivo and in vitro, neurotoxin bound with acetylcholine receptors could not be detected by the immunofluorescence method. It was assumed that the antigenic determinant of the toxin participates in the binding of NT-2 with the acetylcholine receptors "masking" the determinant and destroying its capacity to bind specific antibodies. References: 6; Figure: 1.
[99-2791]

USSR

PATHOGENICITY OF UNSTABLE L-FORMS OF BRUCELLAE AND THEIR REVERTANTS

Prague ZHURNAL GIGIYENY EPIDEMIOLOGII MIKROBIOLOGII I IMMUNOLOGII in Russian Vol 23 No 2 1979 pp 120-124 manuscript received 28 Dec 76

GREKOVA, N. A., TOLMACHEVA, T. A. and VERSHILOVA, P. A., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] The authors have been studying the virulence (in guinea pigs) of L-forms of brucellae,--produced by extended passage on penicillin-containing media--,duration of their persistence in the animal body, and, also, their capacity for reversion. The L-forms were seen to have lost much virulence but did persist in the animal, they did retain a capacity for reversion and were highly resistant to antibiotics (1972,'74 and '75). This article

reports study of the pathogenicity of Br. abortus 870, after passage through penicillin media, and of cultures of revertants of the L-forms obtained in vitro and in vivo. The L-forms were weakly pathogenic, for guinea pigs, causing insignificant response reaction to the reticuloendothelial system; they did possess some toxicity. Revertants obtained in vitro approximated, in pathogenicity, that of the L-forms of the brucella; revertants obtained in vivo approximated the virulent character of the initial, virulent brucella. The authors suggest that the L-forms pose a potential danger to man and animals. References 22: 20 Russian, 2 Western.
[52-8586]

USSR UDC 615-381:576.851.214

NATURAL SELECTION OF THE NISIN-PRODUCING STREPTOCOCCUS LACTIS, MOSCOW STATE UNIVERSITY STRAIN

Moscow BIOLOGICHESKIYE NAUKI in Russian No 11 1979 pp 87-89 manuscript received 20 Jun 79

YEGORDOV, N. S., BARANOVA, I. P., VOLKOV, A. G., GRUSHINA, V. A., GOLIKOVA, T. I., ISAY, P. P., ISAY, YE. I., KOZLOVA, YU. I., KOLESNIKOVA, YE. YU., SIDORENKO, A. T. and SILAYEV, A. B. [Recommended by the Department of Microbiology, Moscow State University imeni M. V. Lomonosov]

[Abstract] This study was made to obtain a culture of Str. lactis which could synthesis a Soviet-made nisin antibiotic; the starting material was a nisin-producing Str. lactis MGU (Moscow State University) strain. Natural selection was employed to produce more-active strains from the antibiotic-producing strain. A total of 580 colonies were isolated and tested for biological activity. One homogeneous strain was isolated which did not exceed the initial strain activity but was stable in the synthesis of nisin at a quantity of 2000-2700 units R/ml. The natural selection involved cultivation of the original strain on a biosynthetic medium (1% glucose, 30 mg% yeast hydrolysate and salts) which contained 4000 to 16000 units R/ml as an additive. References 5 (Russian).
[108-8586]

USSR

QUANTITATIVE PATTERNS OF DEVELOPMENT OF ENDOGENOUS INFECTION IN AN IRRADIATED BODY

Prague ZHURNAL GIGIYENY EPIDEMIOLOGII MIKROBIOLOGII I IMMUNOLOGII in Russian Vol 23 No 2, 1979 pp 113-119 manuscript received 20 Apr 78

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[Abstract] Materials used in the present study were collected from the literature and in the author's work. Results of experimental observations in the literature have been used to develop a formula, $y = a + bx$, designed to show quantitative patterns between dose of ionizing radiation received by an animal (mouse) and the endogenous infection afflicting that animal as a sequel of the applied irradiation. In this formula, y is the degree to which the endogenous infection is expressed, x is the radiation dose, and b is the angular coefficient characterizing the intensification of the endogenous infection with an increase in dose of radiation by 100 roentgens or rads; a is the value of y when $x = 0$. When the injury by the ionizing radiation led to death, as a consequence of a "bond-marrow" syndrome, a straight-line linear relationship was seen to exist between the dose and the expressivity of an endogenous infection; when the death was due to an "intestinal" syndrome, an inverse linear relation was seen to exist between the dose and the inoculation of the microorganisms from internal organs--in the latter case, the pathological action on the body is due to bacterial endotoxins forming in the rupture of microbial cells in the body. The infection and the toxemia substantially exacerbate the acute radiation illness. References 15: 8 Russian, 7 Western
[52-8586]

USSR UDC 577.3

EPR SPECTROSCOPY USED TO STUDY RADIATION DAMAGE TO DNA

Moscow DOKLADY AKADEMII NAUK SSSR in Russian, Vol 248, No 6, 1979 pp 164-pp 1464-1466

[Article by O. S. Avdeyeva. G. T. Rikhireva and M. K. Pulatova, Institute of Chemical Physics, USSR Academy of Sciences, Moscow]

[Abstract] The question of primary radiochemical processes and their role in development of postradiation changes in both the radiosensitive and radioresistant tissues is still open. To explore this question, a series

of -irradiated specimens of radioresistant organs (liver, kidneys, heart, muscle) and of radiosensitive ones (spleen, thymus and bone marrow) was studied by means of low temperature EPR spectroscopy. All EPR spectra were complex and represented the sum of the signals from radical products of the radiolysis of water and chemical cell components. On the basis of the analysis of experimental data, it was concluded that the appearance of the characteristic signal of TH, resulting from the H-adduct to thymine, could be used to indicate DNA damage in a complicated system. The thymine octet was observed at the increased temperature of the analyzed specimen, where protonization of the thymine anion radical took place with the formation of the H-adduct. The principal reactions responsible for the ensuing course of radiation damage were the reactions of electron capture. Figure 1, references 5: 4 Russian, 1 Western.
[96-7813]

USSR UDC 551.510.04

PREDICTION OF AIR POLLUTION LEVEL IN BAKU ON THE BASIS OF MULTIPLE GRAPHIC REGRESSION ANALYSIS

Baku DOKLADY AKADEMII NAUK AZERBAYDZHANSKOY SSR in Russian Vol 35 No 4, 1979 pp 61-65 manuscript received 5 Oct 78

GORCHIYEV, A.A. and SPIRINA, L.N., "KASPIY" Science Center

[Abstract] A graphic approach is presented for predicting air pollution based on parameter P = m/n, where m is the number of air samples in a day with pollutant(s) concentration(s) exceeding by a factor of 1.5 the mean seasonal air concentration of a given pollutant, and n is the total number of samples taken during the day. Calculations made in Baku for the pollutants CO, SO_2, and NO_2 individually and taken together showed that the mean annual P was ca. 0.2 during the 1968-1974 period. Values of P exceeding 0.2 indicate excessive air pollution, while those less than 0.2 indicate less than average pollution. Multiple graphic regression analyses of P with respect to meteorologic factors (prevailing wind velocities, temperature, etc.) for industrial and residential areas of Baku demonstrated P to be valid in predicting air pollution 85-90% of the time in residential areas, and ca. 80-85% accurate in the industrial areas depending on the season of the year. This approach is currently being utilized in predicting air quality in Baku. Figures 3; references 4 (Russian).
[74-12172]

USSR

UDC 596.893.10

ISOLATION OF WEST NILE AND SINDBIS VIRUSES FROM MIGRATORY BIRDS IN TADZHIKISTAN

Dushanbe DOKLADY AKADEMII NAUK TADZHIKSKOY SSR in Russian No 8, 1979 pp 507-509

ABDUSALYAMOV, I.A., Corresponding Member, Academy of Sciences Tadzhik SSR, L'VOV, D.K., Corresponding Member, Academy of Medical Sciences USSR, KOSTYUKOV, M.A., GORDEYEVA, Z.YE., DANIYAROV, O.A., GROMASHEVSKIY, V.L., BULYCHEV, V.P., MURATOV, R.SH., BEREZINA, L.K., SKVORTSOVA, T.K., KONDRASHINA, N., and PAK, T.P., Institute of Zoology and Parasitology, Academy of Sciences Tadzhik SSR, the Tadzhik Scientific Research Institute of Epidemiology and Hygiene, and the Institute of Virology, Academy of Medical Sciences

[Abstract] In 1977 studies were commenced in Tadzhikistan on the isolation of arboviruses from migratory birds. Examination of birds belonging to 67 species resulted in the isolation of four viruses: two were shown to be serologically related to West Nile virus and two to Sindbis virus. This communication represents the first report on the isolation of the West Nile and Sindbis viruses from migratory birds. Tables 1.
[117-12172]

USSR UDC 616.981.455-036.21+616.981.455-084

CURRENT PROBLEMS OF THE NATURAL FOCAL NATURE OF TULAREMIA AND ITS PREVENTION

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 10 Oct 79 pp 3-8 manuscript received 10 Nov 78

OLSUF'YEV, N. G., Institute of Epidemiology and Microbiology imeni Gamaleya, USSR Academy of Medical Sciences

[Abstract] Natural foci of tularemia exist in 14 of the 15 union republics of the USSR--the exception is the KirgizSSR. The foci extend from the Kola Peninsula, Kalingradskaya Oblast and Moldavian SSR, in the West, to the Chukotsk Peninsula, Kamchatka, Sakhalin, and the Khabarovsk and Primorskiy krays. The most northern focus is the Pyasina River in the Taymir Peninsula, the most southern is Kulyab in Tadzhikiston and Zangilan in Azerbaijan. This article cites locales in the Soviet Union where foci exist, the work on its causative agent, its taxonomy and separation into 3 races, drug sensitivity, natural sources of infection, species of animal vectors, transmitting ticks and geographical aspects. Epizootic patterns and biocenoses have been given considerable attention. Serological diagnostic methods and use of

prophylaxis with tularemia vaccine have had considerable success in its control. Plans for its future control include studies on nosogeography of infection, development of an understanding of necessary conditions for existence of foci and their ameliorization, protection by vaccination, natural immunity and epidemiology. It is suggested that in some cases, the USSR has had greater success in the title studies than have non-Soviet workers. References 14 (Russian).
[104-8586]

USSR

UDC 576,851,49

BIOLOGICAL PROPERTIES OF NEWCASTLE SHIGELLAS

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 41, No 5, Sep/Oct 79 pp 535-537

[Article by L. V. Gusakova: (A Study of the Biological Properties of Newcastle Shigellas) Zaporozhskaya Oblast' Sanepid Station]

[Abstract] Newcastle shigellas, isolated from patients in Southern Ukraine during the period when Flexner shigellas were on the rise and Sonne shigellas were decreasing, were investigated in an attempt to determine some common characteristic, such as the biotype, colicinogenotype, etc., which could be used in differential diagnosis. In total, 737 strains were studied. They possessed pronounced biochemical activity - fermenting glucose, galactose, arabinose; and assimilated maltose, dulcite and sorbitol. They were classified as the biotype Boyd-88, according to the classical scheme of Edwards-Ewing. Freshly isolated Newcastle shigellas differed little from other types in their virulence and pathogenecity. Newcastle shigellas were resistant to tetracycline (90.5 percent) and to streptomycin (61.5 percent) Only 21.5 percent were resistant to levomycetin. References 11: 9 Russian, 1 Polish, 1 Western.
[101-7813]

USSR

COMPARATIVE STUDY OF THE EFFECTIVENESS OF PERORAL AND INTRANASAL IMMUNIZATION OF SCHOOLCHILDREN WITH LIVE ALLANTOIC INFLUENZA VACCINE

Prague ZHURNAL GIGIYENY EPIDEMIOLOGII MIKROBIOLOGII I IMMUNOLOGII in Russian Vol 23 No 2 1979 pp 174-179 manuscript received 7 Dec 77

KOVAL', T. A., ALEKSANDROVA, G. I., GRUNIS, A. M., IVANNIKOV, YU. G., MEDVEDEVA, T. YE., SYCHEV, S. V., SHAPOSHNIKOVA, R. P. and SMORODINTSEV, A. A., Department of Virology, Institure of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad; All-Union Scientific-Research Institute of Influenza, USSR Ministry of Health, Leningrad

[Abstract] This study was undertaken in November-December, 1972; the children, 19,257, ranged in age from 7 to 15 years and were from 26 schools. The peroral immunization used a commercial live influenza vaccine from strains A/HongKong /1/68 (H3N2) and V/SSSR 69, prepared at the Leningrad SciRes Institute of Vaccines and Sera, MinHealth USSR, in 1972. The intranasal immunization used a vaccine from cold-adapted variants of the same strains, subjected to 17 and 60 passages at 28°. Monovaccines of the strains were prepared at the production department of the All-Union SciRes Inst. of Influenza, in correspondence with the State Institute of Standardization and Control of Medical Biological Preparations, MH USSR. Results confirmed earlier findings of complete safety and high immunogenic activity of the special variant of the intranasal vaccine. Peroral introduction of the live influenza vaccine, used in the USSR for active immunization of adults against influenza, also stimulated development of immunity, without a vaccinal reaction. The two modes of vaccination provided decrease in frequency of cases of influenza in an epidemic period. References 7: 6 Russian, 1 Western. (Aleksandrova's address is given as the Department of Virology, Institute of Experimental Medicine, USSR AMS 197022 Leningrad, Ulitsa Acad. I. P. Pavlov, 12 USSR).
[52-8586]

USSR UDC 616.915-036.22-02:615.371

INFLUENCE OF ACTIVE IMMUNIZATION ON PERIODICITY AND SEASONALITY OF MEASLES

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 10 Oct 79 pp 29-33 manuscript received 10 Feb 78

BOLOTOVSKIY, V. M., GELIKMAN, B. G., AUZINYA, A. V., GLINSKAYA, YE. V. and
KIBRICK, L. I., Central Scientific Research Institute of Epidemiology,
USSR Ministry of Health, Moscow

[Abstract] Because of a lack of agreement on how great has been the influence of immunization on measles periodicity and seasonality, an analysis has been made of official data on measles incidence from city and rayon sanepid stations (locality not given, except that the city is large--cases are given per 100,000 people). Years involved are i) the pre-vaccination period, 1958-1963; ii) selective immunization period, 1964-1969; and iii) mass vaccination period, 1970-1975. Figures presented depict number of cases over the 1958 to 1976 period, the seasonal spread of cases in the 3 periods, mean daily, monthly and yearly indices of cases in the 3 periods and, finally, the mean daily monthly cases before and after execution of mass immunization and the multiplicity factor of the decrease in incidence. No difference was noted in periodicity or seasonal prevalence in the first and second periods--cyclic rises in incidence occurred at intervals of 1-2 years, peaking in February to May and having its lowest point in August to September. After mass immunization, the interepidemic periods extended up to 7 years; during these periods, incidence shifted to spring and summer months, peaking in May; lowest point was in October. Mass immunization has not yet brought any change in the seasonal spread of incidence in the time of its cyclic rises. Figures 2; references 14: 13 Russian, 1 Western.
[104-8586]

USSR

INFORMATION RETRIEVAL FOR A HUMAN ENGINEERING SERVICE

Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA, SERIYA 14 PSIKHOLOGIYA in Russian
No 3 Jul/Sep 79 pp 44-54 manuscript received 2 Apr 79

LUCHKOV, V. V.

[Abstract] One of the most important needs in the theoretical activity in Soviet engineering psychology (EP) is to work out theories of professionalization of EP and of the organizational problems of EP development. This article represents self-analysis of the subject. Growth of EP as a profession is seen as a multistage process requiring the interaction of industry, science and the state where EP-practitioners know how to organize scientific knowledge and to integrate their discipline into the social economy. On the basis of US experience, three groups of disciplines are seen as important elements: i) a complex of man-technology disciplines (human factors engineering, engineering psychology); ii) industrial-organization psychology and industrial engineering, iii) systems-technology and operations research. Distinctions must be made between the meanings of the language of such disciplines in the US and in the USSR. Need is seen to construct, in the USSR, a model of this discipline, an interdisciplinary model of EP; apparently this has been started. Since EP is an applied profession it demands translation of all available masses of information into a system of information. EP practitioners must search for a universal, organizational form of development and of professionalization of EP to provide normalization of processes of integration of knowledge of the human input, planning and development of the technology, its control or administration and a systematic growth in an engineering psychology treasury or dictionary, viz., an information retrieval system, an IRS. This IRS would have to provide self-knowledge for the EP profession and, consequently, application of its ability to other disciplines. References 9 (Russian).
[47-8586]

USSR

PSYCHOPHYSIOLOGICAL STRESS IN FLYING

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 9 Sep 79 p 18-19

LICHAGIN, P., colonel, military pilot-sharpshooter and ALPATOV, I., colonel, medical service, candidate of medical sciences: "FLIGHT IS NOT STOPPED FOR A SECOND"

[Abstract] This is a general essay article. The authors illustrate, with examples of bombing exercises and formation flying, how very complex and what a split second effort a military pilot's job is. Absolute attention

to the elements of flying is demanded at all times. In the training program, place must be made for post-flight analysis of errors--an analysis which must avoid superficiality, must be prompt, must investigate in detail the physical and technical aspects for correcting errors and achieving the basic parameters of proper flying. Commanders and instructors must demand adherence to occupational work competence, proper rhythm, avoidance of tension even in presence of the unexpected. A truism is that flying is immediate, now, it stops for nothing--hence straying of attention to what has just happened, or just passed, will lead to mistakes. Special training of cadets for coordination of actions--setting up models of various complex situations which demand use of every reserve and of every available operational technique, training in simulated cabins, achievement of realism in simulation of problems. Physicians must participate; psychophysiological traits must be recorded, which could help to expose unstable qualities and, also, help to avoid the consequences of instability; analysis must be made of causes of emotional instability to institute preventive measures. (An accompanying photo shows a plane on an unspecified exercise).
[59-8586]

USSR

FLIGHT SAFETY DEMANDS CONSTANT ATTENTION. ROLE OF BIORHYTHMS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8 1979 pp 42-43

ANNENKO, V., colonel, war pilot, first class and PEKSHEV, V., lt. colonel of the medical service

[Abstract] Effects of long distance flight schedules on plane crews considered. It is stated that most bodily systems function better in the daylight hours than at night. To avoid the loss of working capacity of Soviet airmen who are assigned to long distance flights, (which disrupt biorhythms), emphasis is placed on the need for adaptation training before the flight. For example, the desired adaptation can be achieved by having the airmen take their sleep, over a 3-5 day pre-flight period, and awaken one hour before flight time (to the east) or even later (for flights to the west)-leaving time for the essential pre-flight jobs. This would synchronize biorhythms to the new time belt. When time does not permit this adaptation, the airmen might be asked to execute their responsibilities--in the new time zone--in the morning hours (to the east) and in the evening hours (to the west) at least for a 2-3 day period of synchronizing. Round trip flights wouldn't require adaptation. The best condition for work, at the proper time of day, is assuring the very best preparation for the particular task. One of the ways to assure safety is perfection of the forms and methods of planning, organization and execution of long distance flights--using the advancements of science. Knowledge of the fundamentals of psychophysiology and biorhythmology, combining periodicity of daily working ability with the demands of the job, is a reliable basis for improvement of training.
[58-8586]

USSR UDC 612.82

STUDY OF HIGHER NERVOUS ACTIVITY WITH THE PNN-2 DEVICE

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 5 No 5 Sep/Oct 79 pp 945-948
manuscript received 8 Jun 76

KOL'CHENKO, N. V., MOLDAVSKAYA, S. I. and TROSHIKHIN, V. A. (deceased), Institute of Physiology imeni A. A. Bogomolets, UkrSSR Academy of Sciences, Kiev

[Abstract] The PNN-2 [letters derived from its Russian-language description] is a device to study neuropsychic stress. The device had been developed, by the authors, in 1975 at the Experimental-Design Construction unit of their Kiev institute, following which a small series of the electronic-design instrument was prepared. It differed from earlier devices in that i) it could be used to measure a great number of indices which characterize the individual features and functional status of higher nervous activity and ii) it could determine more rapidly--4.5 min in contrast to 25-30 min with the previous device--the indices of functional lability of nervous processes and work-capacity of the brain. A photo of the device is given with its various features indicated. The PNN-2 measures the latent period of motor response to visual and sound stimuli--reaction of hands and feet, duration of response, response in a sequence of stimuli. The methodology employed is attributed to A. B. Khil'chenko (1958). Use of the device is compared with use of the previously-employed device, PPCh; results with each are tabulated. Reaction times to stimuli are suggested as a means to gain insight to lability of nervous processes. The device is felt to be useful in industrial production situations. Figure 1; references 4 (Russian)
[526-8856]

USSR

UDC 612.821

VEGETATIVE REACTIONS DURING VOLUNTARY CONTROL OF ALPHA RHYTHM

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 5 No 5 Sep/Oct 79 pp 927-930
manuscript received 5 Dec 77

MARKMAN, V. G.: (DYNAMICS OF VEGETATIVE REACTIONS DURING VOLUNTARY CONTROL OF THE ALPHA RHYTHM) Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Leningrad

[Abstract] Note is taken of the paucity of prior study of any connection between voluntary changes in the alpha rhythm and changes in vegetative indices. Markman had measured (1977) changes in intensity of the alpha

rhythm during arbitrary control, changes in frequency of cardiac contractions and in skin-galvanic responses at the same time; he then suggested that interaction in these parameters should occur, if at all, with a definite shift in time. The present study is an attempt to verify the suggestion. The procedure used was described in earlier reports (this journal Vol 3, No 3, 1977, p 464; Vol 3, No 3, 1977, p 490). It is apparently possible, with that procedure, to assess the degree of connection between changes in vegetative responses and in alpha rhythm in the process of training and the time of interaction between them. Two groups were used in this article: 5 individuals who had mastered the technique of increasing the alpha rhythm, and 5 who were not familiar with it. The ability, with feedback, to raise one's own alpha rhythm was coupled with a dynamic, correlated connection of the alpha rhythm with changes in the vegetative indices. Differences among the test subjects were attributed to differences in the functional organization of hypothalamo-cortical associations; these differences could serve as a criterion for selection of job applicants. Figure 1; references 8 (Russian).
[526-8586]

USSR

UDC 591.526:578.087.1

POPULATION DEGENERATION IN A RANDOM ENVIRONMENT

Moscow ZHURNAL OBSHCHEY BIOLOGII in Russian Vol 40, No 6, Nov/Dec 79 pp 851-859

[Article by Yu. M. Svirezhev and A. P. Sidorin, Computer Center, USSR Academy of Sciences, Moscow]

[Abstract] Population behavior under extreme strees represents an interesting problem. This study was devoted to the relationship between population degeneration and various parameters describing their behavior facing random disturbance. The Vol'terra model was used as the starting model of a population or association of various species, supplemented by additive effects of the "white noise" type with varying relationships between its intensity and the biomass of the species. The biomass of the species represents a random process determined by the parameters of a nonperturbed system and by the intensity of random fluctuations. Mathematical treatment of this model led to the biological interpretation that, in a single dimension case, the probability of the degeneration of a species depends on the relationship between the biomass and the intensity of y_o/o fluctuation, where y_o=relative biomass of the species and o=intensity of the random effect. When more than one species is involved, the degeneration problem depends on each biomass, the intensity of each effect and the relationship between them. Figure 1, references 7: 5 Russian, 2 Western.
[109-7813]

PSYCHOLOGY

USSR UDC 616.89-072.8:061.6(049.2)

PSYCHOLOGICAL LABORATORIES

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII in Russian Vol 79 No 8 1979
pp 1119-1120

BLEYKHER, V. M., Kiev

[Abstract] This is a contribution to a discussion proposed by the source journal on the organizational character of ongoing work of psychological laboratories (PL) in psychiatric hospitals. (The source journal had kicked off the discussion by publication of an article by Zeygarik and Rubinshteyn, this journal, 1978, No 12, pp 1861-1863). Apparently PL have been set up at some installations due to the courageous initiative of the head physicians at the psychiatric hospitals; the author feels the PL are essential for rational organization of work and the professional growth of pathopsychologists. As for training of key personnel, medical graduates are not yet prepared in general and applied psychology. A PL should be at hand for the pathopsychologist who shouldn't have to consult a psychology faculty at a university. Use of testing is mentioned; the MMPI test is not objected to, but testing should not be confined to it alone (besides, evaluation of answers requires highly-qualified specialists). Training of pathopsychologists is insufficient (e.g., Kiev University has a lecture course of 68 hrs for pathological and neuropsychology, no laboratory or separate course in psychiatry). The author sees the psychologist--in contrast to the West --as only a helper of the psychotherapist; he objects to giving major responsibility, for rehabilitation of patients, to psychologists. Pathopsychologists should not be expected to give a clinical diagnosis (this is compared to asking a laboratory worker to diagnose a case on the basis of blood and spinal fluid lab tests). Numbers of psychologists to be assigned to laboratories is still an unsolved question which could be resolved by advice of competent Moscow and Leningrad laboratories, with due regard for local conditions. Also to be resolved is the legal status of pathopsychologists as well as their licensing. Organizational-methodological centers for psychopathology ought to be set up, not only in Moscow, but in the Union republic capitals. The UkrSSR Ministry of Health is presently planning such a center.
[22]

CSO: 1840 - END -

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